

### Abstract

Several genes encoding subunits of the neuronal nicotinic acetylcholine receptors have been cloned and regulatory elements involved in the transcription of the  $\alpha:2$  and  $\alpha:7$ -subunit genes have been described. Yet, the detailed mechanisms governing the neuron-specific transcription and the spatio-temporal expression pattern of these genes remain largely uninvestigated. The  $\beta 2$ -subunit is the most widely expressed neuronal nicotinic receptors subunit in the nervous system. We have studied the structural and regulatory properties of the 5' sequence of this gene. A fragment of 1163 bp of upstream sequence is sufficient to drive the cell-specific transcription of a reporter gene in both transient transfection assays and in transgenic mice. Deletion analysis and site-directed mutagenesis of this promoter reveal two negative and one positive element. The positively acting sequence includes one functional E-box. One of the repressor elements is located in the transcribed region and is the NRSE/RE1 sequence already described in promoters of neuronal genes.

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## ABSTRACT

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